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Implementation of the Edinburgh Postpartum Depression Screening Tool for Postpartum Depression in a Midwest Primary Care Clinic

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Advisory Committee

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Abstract

Problem: Postpartum depression is a prevalent health concern in postpartum women. Screening practices to identify postpartum depression are inconsistent. The purpose of this quality initiative is to determine if the implementation of the Edinburgh Postpartum Depression Screening Tool (EPDS) to screen for postpartum depression in the primary care setting increases the detection of postpartum depression in postpartum women from delivery to one year postpartum.

Methods: This quality improvement project utilizes a descriptive, observational design. A retrospective medical record review was utilized as well as a 12-week data collection period. Retrospective medical record reviews were conducted to assess the rate of depression screening over a 12-week time. Then, medical record reviews were conducted after implementation of the EPDS to assess the rate of depression screening utilizing the EPDS over a period of 12 weeks.

Results: A total of 16 patients received the intervention (n=16). The rate of patients who received the EPDS was 36% (n=4). Of the patients screened for depression with the EPDS, none received a score greater than 12 which is a high indicator for postpartum depression (n=0). However, of those patients screened, 25% were prescribed medication therapy (n=1).

Implications for Practice: Findings support the continued use of a validated depression screening tool to assess depression risk. Prior to this project, there was no formal depression screening for postpartum women. The EPDS was successfully implemented and the family medicine clinic is better prepared to identify postpartum women and screen for depression risk.

Implementation of the Edinburgh Postpartum Depression Screening Tool for Postpartum Depression in a Midwest Primary Care Clinic

Postpartum depression (PPD) is a prevalent health concern affecting many postpartum women in the United States from infant birth to one year postpartum. PPD is a mental health diagnosis associated with peripartum onset that primarily involves feelings of depression or loss of interest (Mughal et al., 2022). Other symptoms of PPD can include insomnia, hypersomnia, agitation, guilt, worthlessness, loss of energy, increased fatigue, indecisiveness, change in weight or appetite, impaired concentration, psychomotor depression, and suicidal ideation. A diagnosis of PPD is considered when at least five depressive symptoms are present for a minimum of two weeks in the time-period of infant birth up to one year postpartum (Mughal et al., 2022). Research surrounding PPD has found that PPD can have significant negative consequences on the postpartum individual, their offspring, and the family unit (Yu et al., 2021). Risk factors for PPD identified in the literature include a history of mental illness, a negative attitude towards the baby, a history of sexual, physical, or verbal abuse, obstetric risk factors or pregnancy complications, poor social support, and poor lifestyle habits, including eating habits, physical activity, and sleep (Mughal et al., 2022).

Many women have been identified as struggling with PPD. Around one in seven women have been found to experience PPD, with an estimated 50% of women going undiagnosed and untreated (Mughal et al., 2022). PPD has been found to occur in women of all ages, including adolescents. PPD related suicide has become the second leading cause of death in postpartum women, making PPD a serious health concern (Yu et al., 2021). Current screening practices to identify PPD in postpartum women vary greatly and

inconsistencies in recommendations for screening and screening cutoffs exist. Irregularity in screening and screening recommendations are one contributing factor leading to gaps in the identification and treatment of women struggling with PPD and PPD related symptoms.

The Edinburgh Postnatal Depression Scale (EPDS) is a widely-utilized screening tool implemented in the United States for PPD screening but is not routinely used in the primary care setting. Another screening tool, the patient health questionnaire 2 and 9 is most often used in the primary care setting but does not have indications for screening in postpartum women. Screening with the EPDS is most often conducted at the infant's well-child visits occurring at one month, two months, four months, six months, nine months, and one year (Premji et al., 2019). Screening practices have been found to vary from clinic to clinic, with some clinics screening at set increments and other clinics screening not at all (Sidebottom et al., 2020). Several factors have been identified contributing to screening success in the outpatient setting. Identified factors include the type of provider, clinic site, the age of patient, the inclusion of screening as part of the clinic's established practices, type of charting platform, and nursing follow-up to ensure screening practices (Sidebottom et al., 2021).

In the primary care setting, there is room for improvement in screening practices for PPD in postpartum women. The purpose of this project is to determine if the implementation of the EPDS to screen for postpartum depression in the primary care setting increases the detection of PPD in postpartum women ages 18 to 44 from delivery to one year postpartum. The Institute of Healthcare Improvements Model for Change using Plan-Do-Study-Act (PDSA) cycles serves as the framework to guide this quality

improvement project. The aim of this study is to increase the number of women screened for PPD in the primary care setting and therefore increase the detection of PPD. The primary outcome measure identified for this project is the rate of postpartum women screened in the primary care setting with the EPDS. Secondary outcome measures include EPDS scores, and treatment including medication and/or referral, when indicated by a positive screening result. The study questions guiding this quality improvement project are: In women being seen in the primary care setting up to one year postpartum, within a 12 week timeframe:

1. What is the rate of screening for postpartum depression (PPD), compared to no formal PPD screening, after implementation of the Edinburgh Postnatal Depression Scale in women ages 18 to 44?
2. When the Edinburgh Postnatal Depression Scale was positive, indicating PPD risk, what is the rate of treatment including medication and/or referral in women ages 18 to 44?

Review of Literature

A literature search and review was performed on pertinent literature surrounding the Edinburgh Postpartum Depression Scale and its use in the primary care setting. The search engines utilized for this literature search include Medline (EBSCO), CINAHL and ScienceDirect. Key search terms and phrases included *postpartum depression, screening, Edinburgh Postnatal Depression Scale, EPDS, EPDS Screening, postpartum depression tools, postpartum depression screening, PPD screening tool, postnatal depression tool,* and *anxiety,* with the use of the Boolean operators AND, OR, and NOT. Initially, 9,050 publications were generated from the key search terms and phrases. Inclusion criteria for

this literature review included peer-reviewed publications, publications published from 2016-2023, publications in English, and full text publications. Exclusion criteria for this literature review excluded publications not peer-reviewed, publications published prior to 2016, publications not in English, and non-full text publications.

Postpartum women are at risk for several adverse health outcomes in the postnatal period, including postpartum depression. Postpartum depression affects not only postpartum women, but also their infants. Slomian et al. (2019) conducted a systematic review of 122 studies focusing on the maternal and infant consequences of postpartum depression. Maternal consequences of postpartum depression included higher instances of postpartum weight retention, lower perceived physical health status, lower self-esteem, higher levels of anger with less anger control, increased diagnosis of an accompanying anxiety disorder, lower self-reported scores regarding quality of life, poor perceived social support, reported distant and cold partner relationships, and increased participation in smoking and alcohol use (Slomian et al., 2019).

Infant consequences resulting from maternal PPD were included in nine studies reporting decreased weight or height stunting in infants of women diagnosed with depression. Furthermore, nine studies found a significant association between maternal PPD and infant health concerns including increased occurrences of illnesses (Slomian et al., 2019). Studies found significant effects of PPD on infant cognitive and motor development and four studies found an association between PPD and poor emotional development of the infant (Slomian et al., 2019). This study conducted by Slomian et al. (2019) is one of the first systematic reviews focusing on the consequences of maternal PPD and therefore further research is needed on this topic.

Infant consequences of PPD have not only been identified in the initial years of the child's life but also later in life. A 2020 cohort study showed that children up to 12 years of age, whose mothers struggles with PPD and anxiety, had long term impacts (Walker et al., 2020). Research by Walker et al. (2020) found that children of women with PPD had higher instances of emotional problems at 11-12 years of age (Walker et al., 2020). Potential factors contributing to the link between maternal PPD and child development issues were identified as lack of maternal sensitivity, inadequate mother-child interaction, and altered infant neurodevelopment (Walker et al., 2020).

Current screening practices for PPD in the United States and worldwide vary greatly. A large U.S. study of 7548 women from 35 different clinics found that only 64.4% of women were screened for PPD within three months of delivery. Furthermore, PPD screening practices varied from clinic to clinic with PPD screening rates ranging from 24.8% to 95.6% (Sidebottom et al., 2020). A similar study conducted in 2019 examining screening practices and the validity of PPD screening found that 13% of women who saw a provider in the postpartum period up to 1 year postpartum were not screened for PPD (Premji et al., 2019).

Screening practices for PPD vary in the percentage of women screened but also in when women are screened, how they are screened, and how frequently they are screened. A systematic review on community-based care settings found inconsistencies in screening practices across multiple countries. Of the 47 studies included, 39 reported that PPD screening was conducted in the home setting, while the remaining studies screened at community or healthcare centers (Bhat et al., 2021). Fifteen studies screened for PPD during both pregnancy and postpartum, 20 studies screened only during the postpartum

period, and the remaining 12 studies screened only in pregnancy (Bhat et al., 2021). The PPD screening tool utilized most often across all 47 studies was the Edinburgh Postnatal Depression Scale (EPDS) (Bhat et al., 2021). Other screening tools found to be utilized for PPD screening include the Patient Health Questionnaire 2 (PHQ-2) and the Patient Health Questionnaire 9 (PHQ-9) (Sidebottom et al., 2020). Gaps in the literature exist on comparing the use of the EPDS versus the PHQ-2 or PHQ-9 for depression screening in the postpartum period.

The Edinburgh Postnatal Depression Scale is one of the most widely utilized PPD screening tools with a large amount of research surrounding its validity and use. Marcias-Cortes, Lima-Gomez, and Asbun-Bojalil (2019) conducted a large study screening 411 women with the EPDS during the postpartum period. Utilizing a cutoff point of 12 (women scoring 12 and above were considered a positive screening), the EPDS was found to have a sensitivity of 70.4% and a specificity of 72.2%, making it a moderately accurate tool (Marcias-Cortes et al., 2019). Cutoff values above 12 revealed higher specificity but less sensitivity (Marcias-Cortes et al., 2019). A systematic review by Levis et al. (2020) suggested similar findings. Utilizing a cutoff EPDS score of 11, sensitivity was 81% and specificity was 88%. This study differed in that cutoff values of 13 or above revealed higher specificity but less sensitivity instead of utilizing 12 and above (Levis et al., 2020). A third study analyzing the EPDS tool found that the EPDS is a reliable tool for screening for PPD and diagnosing depression according to DSM-5 and ICD-10 criteria. At a cutoff score of 12 or more this study revealed sensitivity of 77% and specificity of 96%. Like the two previous studies mentioned, both cutoff scores of 12

to 13 or higher revealed increased specificity but decreased sensitivity (Smith-Nielsen et al., 2018).

Screening for PPD in primary care settings is one way to identify women struggling with PPD. Literature on the use of PPD screening in primary care practices is limited, however, the following systematic reviews highlight the importance of screening approaches in various settings. The first systematic review conducted by O'Conner et al. (2016) is an evidence report for the U.S. Preventative Services Task Force aimed at identifying the benefits and harms of depression screening. Out of six studies included in the systematic review focusing on the benefits of PPD screening, none identified harms of PPD screening in the primary care setting (O'Conner et al., 2016). Overall, evidence from this systematic review concluded that screening pregnant and postpartum women for depression in the primary care setting reduced the overall prevalence of depression and increased remission (O'Conner et al., 2016). Limitations of this review include that there was only a small number of studies surrounding research in the primary care setting therefore, further research is needed on this topic.

The second systematic review highlighting the importance of PPD screening in various settings was conducted by Park and Kim (2022) and focuses on the predictive validity of the EPDS in screening for PPD in pregnant and postpartum women. Seventeen studies and 2902 women were included in this systematic review and meta-analysis. Pooled sensitivity and specificity of the EPDS tool were 79% and 88% respectively (Park & Kim, 2022). This study found the EPDS to be an accurate screening tool for PPD and recommended its use in both the primary care setting and midwifery centers (Park & Kim, 2022). Both systematic reviews identified positives to screening for PPD in the

primary care setting. Further research on this topic could strengthen the literature supporting screening in this setting.

The evidence-based practice model used to guide this project is the Institute for Healthcare Improvements Model for Change that focuses on quality improvement. This widely utilized framework aims to determine if an implemented change leads to improvement over time (Agency for Healthcare Research and Quality, 2020). Plan-Do-Study-Act (PDSA) cycles are utilized in this framework to consistently evaluate results and make changes as needed. The "Plan" stage of this cycle involves assembling a team, evaluating current processes of interest and identifying the problem, determining causes of the problem and potential solutions, and developing an action plan. The "Do" stage of the PDSA cycle involves implementing the action plan and collecting data (Agency for Healthcare Research and Quality, 2020). The "Study" stage involves analyzing data to determine if the plan and actions produced improvement. The last stage of the PDSA cycle is the "Act" stage. In this stage, the outcomes are reflected upon and continuation of the quality improvement process is determined (Agency for Healthcare Research and Quality, 2020). The Model for Change is an appropriate framework for research surrounding PPD as PPD is an ongoing issue and PPD screening practices are evolving over time. PDSA cycles allow for continuous improvement and change of PPD screening practices as needed.

In summary, PPD is a prevalent health concern women can experience during the postpartum period that can have several consequences on their own health and the health of their infants. PPD can be recognized and treated early with proper screening and identification. Current PPD screening practices, including timing, frequency, setting and

standardized screening tool used, remain inconsistent. Expanded and consistent screening practices and the utilization of an accurate screening tool such as the EPDS can aid in identifying women at risk for PPD and subsequently provide treatment including medication and/or referral, as indicated. The use of the Model for Change as a framework for research surrounding PPD screening practices is beneficial as it allows for continuous evaluation and change. Gaps in the literature exist surrounding PPD screening in the primary care setting despite primary care providers caring for a large population of postpartum women. Select studies have identified positive aspects of expanding screening in these care settings. Further research is warranted to guide PPD screening recommendations in this at-risk population.

Methods

Design.

This quality improvement project followed a descriptive, observational design. A retrospective medical record review was utilized over a 12-week data collection period. Retrospective medical record reviews were conducted to assess the rate of depression screening over a 12-week time. Then, medical record reviews were conducted after implementation of the EPDS to assess the rate of depression screening utilizing the Edinburgh Postnatal Depression Scale over a period of 12 weeks. Additional outcome measures included age, race, insurance status, EPDS scores and treatment provided including medication or referrals.

Setting.

The setting was a small, semi-rural, Midwestern family practice serving approximately 9000 individuals. This family practice serves patients across the lifespan

from birth to older adults as well as individuals of all ethnic, racial, and economic backgrounds.

Sample.

A convenience sample of postpartum women presenting to the family practice for services from January 15, 2024 to April 8, 2024 was obtained. Inclusion criteria included postpartum women up to one year postpartum who were ages 18 to 44. Visit types included annual exams, chronic conditions coordination, follow-up, mental health, episodic care, gynecological, and postpartum appointments. Exclusion criteria included patients less than 18 years of age, women presenting with their children for well child appointments, and women greater than one year postpartum.

Approval Process.

This project was approved by the institutional IRB as well as the university IRB.

Data Collection and Analysis.

The principle investigator conducted a retrospective medical record review of all female patients of childbearing age from October 22, 2023 to January 14, 2024. Any patients identified as up to one year postpartum had data extracted from their electronic medical record including the depression screening tool utilized, type of visit the patient presented for, and treatment provided including medication or referral. Data was de-identified and study participants coded as A1, A2, A3, etc. Data was compiled into a Microsoft Excel spreadsheet and password protected on a Mercy computer.

After the retrospective medical record review period was complete, implementation of the 10-question validated EPDS took place. From January 15, 2024 to April 8, 2024 all females of childbearing ages of 18 to 44 who presented to the family

practice for one of the approved visit types were asked if they are newly postpartum within the past 12 months. Patients self-identifying as up to one year postpartum were asked to fill out an EPDS. Patients were presented with a laminated paper EPDS screening form to fill out (Appendix A). The medical assistant collected the EPDS form from the patient, uploaded the responses into the secure electronic medical record (EMR) and wiped the laminated paper clean. Utilizing a cut-off score of 12 or greater indicating severe risk for depression as evidenced by the literature, any patients scoring 12 or above prompted automatic notification of the provider by the medical assistant. The provider seeing the patient for that visit will review the EPDS score and manage the patient as they see appropriate. Any patients endorsing thoughts of suicidal or homicidal ideations with an active plan will prompt immediate notification of the provider by the medical assistant and be transported to the nearest Emergency Department for mental health evaluation.

The DNP student conducted a medical record review of all female patients of childbearing age from January 15, 2024 to April 8, 2024. Any patients identified as up to one year postpartum had data extracted from their chart including depression screening tool utilized, depression screening score, type of visit, and treatment including medication or referral. Data was de-identified and study participants coded as B1, B2, B3, etc. Data was compiled into a Microsoft Excel spreadsheet and password protected on a Mercy computer.

Descriptive statistics were utilized to describe the sample population. A Fisher's Exact Test will be utilized to compare the rate of depression screening prior to implementation of the EPDS verses rate of screening after implementation of the EPDS.

Results

A total of 16 patients received the intervention (*n*=16). The category of gender was female (*n*=16, 100%). The most frequently observed category of Race was Caucasian (*n*=15, 93.75%), followed by multi-racial (*n*=1, 6.25%). The most common visit presentation was annual visit (*n*=9, 56.25%), followed by episodic care (*n*=6, 38%). All patients included had health insurance (n=16, 100%). The average age of patients screened was 29.50 years (SD=5.27). See Appendix B. Approximately 69% of patients received a PHQ-2 and PHQ-9 screening (*n*=11) which was the standard of care prior to project implementation. One PHQ-2 and PHQ-9 screening was identified as positive (*n*=1, 6%). The screening identified as positive resulted in referral to behavioral health.

Following the intervention, the rate of patients who received the Edinburgh Postnatal Depression Screening (EPDS) was 36% (*n*=4). Of the patients screened for depression with the EPDS, none received a score greater than 12 which is a high indicator for postpartum depression (*n*=0). However, of those patients screened, 25% were prescribed medication therapy (n=1).

A Fisher's exact test was conducted to examine the relationship between the pre and post implementation groups and the screening performed. There were 2 levels in the Pre and Post category: Pre implementation group and Post implementation group. There were 3 levels in Screening Tool: PHQ 2 & 9, None, and EPDS. The Fisher exact test was insignificant based on the alpha value of .05, *p*=.385. This implies that pre-implementation group did not significantly differ from the post implementation group regarding screening practices. See Appendix C.

Discussion

Results in this study demonstrated the rate of depression screenings administered were high in both the pre-implementation and post-implementation groups. The pre-implementation group received a PHQ-2 and PHQ-9 66.6% of the time, which is the current standard of screening at the project implementation site (*n*=6). The post-implementation group received a depression screening 68.7% of the time, receiving either the PHQ-2 and PHQ-9 or the validated EPDS (*n*=11). These results show consistency in the overall rate of depression screening between the two groups.

The total number of patients included in both the pre-and post-implementation groups was 25. Of the 25 women included in the study, one had a positive depression screening score and was referred to behavioral health (*n*=1). The remaining 24 women either had a negative depression screening, or no screening completed. Four patients with negative depression screening scores were prescribed medication therapy as documented in the chart (*n*=4).

This project focused on the implementation of the EPDS in postpartum women between the ages of 18 and 44. Of the 16 women meeting inclusion criteria to receive the EPDS screening, four received the appropriate screening (*n*=4). Seven women received the current standard of care screening which is the PHQ-2 and PHQ-9 (*n*=7). Five women received no depression screening (*n*=5). This result highlights 12 missed screening opportunities for screening women with the EPDS. Due to the identification of missed screenings, the DNP student provided follow up office education on the importance of identification and completion of the EPDS by office staff halfway through the project implementation period. Limitations to appropriate screening include identifying patients appropriate for screening by office staff, obtaining a completed screening, and uploading

the screening into the EHR by office staff. Further research is needed with larger sample sizes to determine if use of the EPDS is indicated in the primary care setting.

Current recommendations for depression screening support use of the PHQ-2 and PHQ-9 in the primary care setting and screening postpartum women with the EPDS at the infant's well-child visits occurring at one month, two months, four months, six months, nine months, and one year (Premji et al., 2019). The most successful depression screening rates for this project occurred with the use of the PHQ-2 and PHQ-9 tools. The success of screening with this tool may be due to office staff being more familiar with the tool and its administration process as well as ease of use. Limitations still surrounded depression screening as not all patients received an appropriate depression screening. A recommendation for future study is to determine the reasons for variability in screening administration in both postpartum and non-postpartum patients.

Although statistical significance was not met in this quality improvement initiative it is important to note clinical significance. Office staff highlighted increasing attention and awareness to postpartum woman, postpartum depression and depression screening practices during the data collection period. This suggests that implementation of the EPDS along with education on PPD in the primary care setting aids clinic staff in identify at risk postpartum women and screening for depression risk.

Conclusion

The EPDS was successfully implemented in this family medicine clinic when no other formal postpartum depression screening was previously utilized. Increased knowledge of the screening tool as well as familiarity with the screening process may enhance its use. Further research with larger sample sizes is needed to determine if the

EPDS is a valuable tool for continued use in the primary care setting. Clinical significance for this project was highlighted through increasing knowledge and awareness of PPD and PPD screening.

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Appendix A

Edinburgh Postnatal Depression Scale (EPDS)

Patient Label

Mother's OB or Doctor's Name: _____

Doctor's Phone #: _____

Since you are either pregnant or have recently had a baby, we want to know how you feel. Please place a **CHECK MARK** (✔) on the blank by the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**—*not just how you feel today.* Complete all 10 items and find your score by adding each number that appears in parentheses (#) by your checked answer. This is a screening test; not a medical diagnosis. If something doesn't seem right, *call your health care provider regardless of your score.*

Below is an example already completed.

I have felt happy:
Yes, all of the time ____ (0)
Yes, most of the time ✔ (1)
No, not very often ____ (2)
No, not at all ____ (3)

This would mean: "I have felt happy most of the time" in the past week. Please complete the other questions in the same way.

1. I have been able to laugh and see the funny side of things:
   As much as I always could ____ (0)
   Not quite so much now ____ (1)
   Definitely not so much now ____ (2)
   Not at all ____ (3)

2. I have looked forward with enjoyment to things:
   As much as I ever did ____ (0)
   Rather less than I used to ____ (1)
   Definitely less than I used to ____ (2)
   Hardly at all ____ (3)

3. I have blamed myself unnecessarily when things went wrong:
   Yes, most of the time ____ (3)
   Yes, some of the time ____ (2)
   Not very often ____ (1)
   No, never ____ (0)

4. I have been anxious or worried for no good reason:
   No, not at all ____ (0)
   Hardly ever ____ (1)
   Yes, sometimes ____ (2)
   Yes, very often ____ (3)

5. I have felt scared or panicky for no good reason:
   Yes, quite a lot ____ (3)
   Yes, sometimes ____ (2)
   No, not much ____ (1)
   No, not at all ____ (0)

6. Things have been getting to me:
   Yes, most of the time I haven't been able to cope at all ____ (3)
   Yes, sometimes I haven't been coping as well as usual ____ (2)
   No, most of the time I have coped quite well ____ (1)
   No, I have been coping as well as ever ____ (0)

7. I have been so unhappy that I have had difficulty sleeping:
   Yes, most of the time ____ (3)
   Yes, sometimes ____ (2)
   No, not very often ____ (1)
   No, not at all ____ (0)

8. I have felt sad or miserable:
   Yes, most of the time ____ (3)
   Yes, quite often ____ (2)
   Not very often ____ (1)
   No, not at all ____ (0)

9. I have been so unhappy that I have been crying:
   Yes, most of the time ____ (3)
   Yes, quite often ____ (2)
   Only occasionally ____ (1)
   No, never ____ (0)

10. The thought of harming myself has occurred to me:*
    Yes, quite often ____ (3)
    Sometimes ____ (2)
    Hardly ever ____ (1)
    Never ____ (0)

TOTAL YOUR SCORE HERE ▶

Thank you for completing this survey. Your doctor will score this survey and discuss the results with you.

Verbal consent to contact above mentioned MD witnessed by:

_____

Edinburgh Postnatal Depression Scale (EPDS). Adapted from the *British Journal of Psychiatry*, June, 1987, vol. 150 by J.L. Cox, J.M. Holden, R. Segovsky.

Appendix B

Table 1

Frequency Table for Demographics

Variable	*n*	*%*
Race		
Caucasian	15	93.75
Multi-Racial	1	6.25
Missing	0	0.00
Visit Type		
Annual Exam	9	56.25
Acute	6	37.50
Chronic Conditions Coordination	1	6.25
Missing	0	0.00
Insurance yes/no		
Yes	16	100.00
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Appendix C

Table 2 – Fishers Exact Test

Observed and Expected Frequencies

	Pre/Post		
Screening Tool	Pre	Post	*p*
PHQ 2 & 9	6[4.68]	7[8.32]	.385
None	3[2.88]	5[5.12]	
EPDS	0[1.44]	4[2.56]	

Note. Values formatted as Observed[Expected].